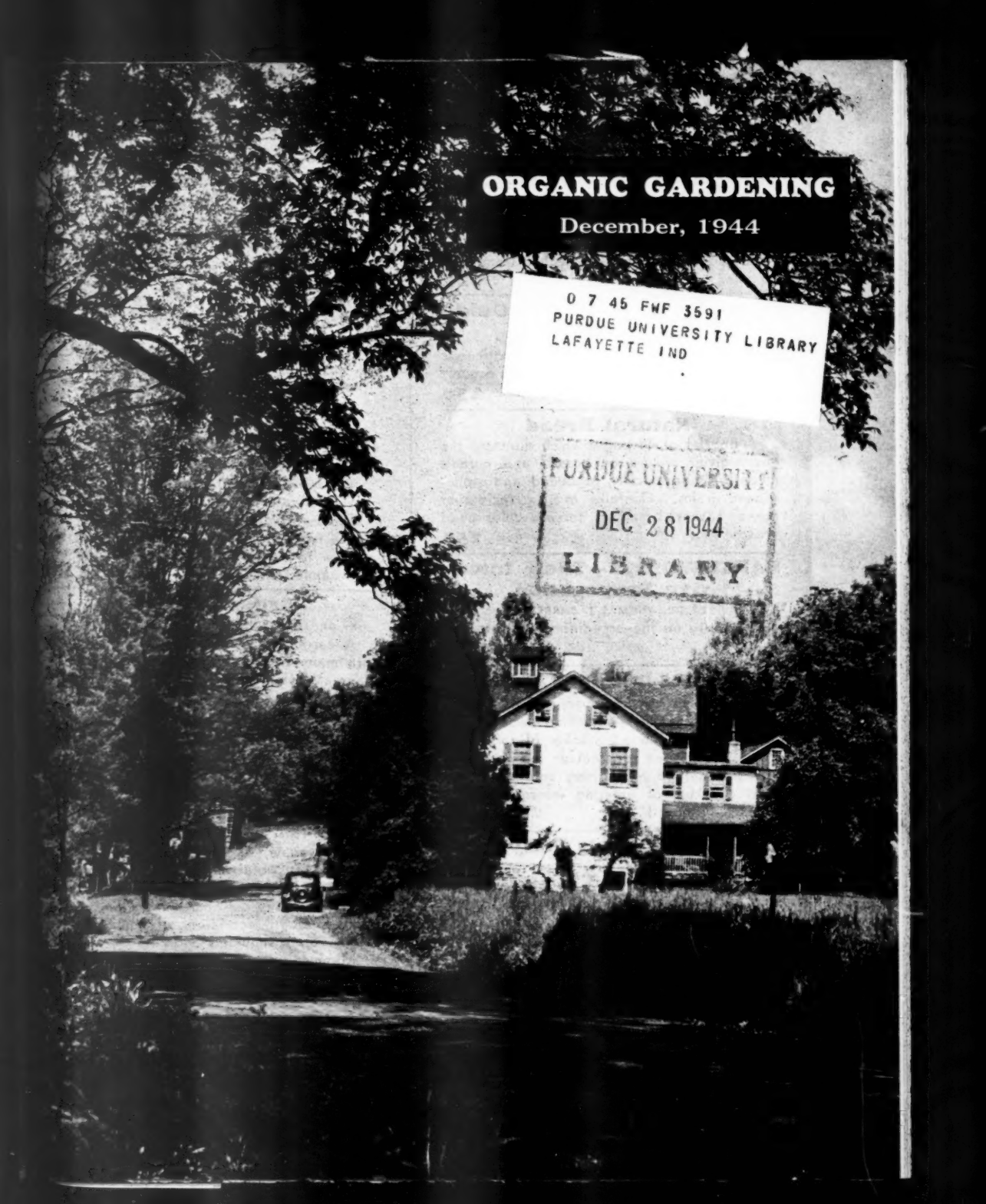

ORGANIC GARDENING

December, 1944

0 7 45 FWF 3591
PURDUE UNIVERSITY LIBRARY
LAFAYETTE IND

PURDUE UNIVERSITY
DEC 28 1944
LIBRARY

ORGANIC GARDENING BOOKS

COMPOST — How To Make It

A pamphlet of 64 pages answering many questions about the best way to make compost. This book consists of material that has appeared in Organic Gardening from time to time. **.25**

Vest-Pocket Vegetable Guide

By ROGER W. SMITH

A little booklet of 64 pages that discusses the growing of 40 vegetables in the organic manner. For medium northern climate. **25c**

Natural Bread

A booklet of 48 pages which discusses the health-giving values of breads and cereals made with organically produced and stone-ground grains. Contains many recipes of bread, scones, breakfast cereals, unleavened breads, etc. **25c**

EARTHWORMS — Their Intensive Propagation

By DR. THOMAS J. BARRETT,
an authority on the breeding of earthworms.
$1.00

3 Debates in House of Lords

A pamphlet of 55 pages which gives in complete form the two thrilling debates held in England on the advisability of forming a Royal Commission to check on the Sir Albert Howard method of farming and gardening. It is chockfull of amazing information and reads like a novel. . . . . **.25**

Plowman's Folly

By EDWARD H. FAULKNER

While we do not quite agree with Mr. Faulkner's main theme we believe this to be a valuable book which should be read by everyone interested in organic farming and gardening. There is much interesting material in the book showing how to increase the humus content of soils. **$1.00**

Vegetable Mould And Earthworms

By CHARLES DARWIN

This is a pamphlet which represents a condensed version of Darwin's famous classic on the earthworm. It contains the most important parts of his revolutionary work and is a MUST for every organic gardener and farmer. **.25**

Bio-Dynamic Farming And Gardening

By DR. EHRENFRIED PFEIFFER

A 240 page clothbound book describing in full the Bio-Dynamic methods, by an acknowledged authority. Some of the chapters are:

The farmer of yesterday and today
The soil, a living organism
The load limit in agriculture
The treatment of manure and compost
How to convert an ordinary into a bio-dynamic farm., etc., etc. **$2.00**

Grow A Garden

By DR. EHRENFRIED PFEIFFER And ERIKA RIESE

A cardboard covered book of 118 pages with many beautiful illustrations and garden plans. Written from a practical background of many years of actual experience.

Gives detailed instructions for growing each vegetable from the bio-dynamic point of view and is a gold-mine of information of untold value to the home gardener. **$1.25**

Sleep And Rheumatism

A CLOTHBOUND BOOK — By J. I. Rodale
Editor of ORGANIC GARDENING

Mr. Rodale, always interested in natural methods of obtaining health, has made a startling discovery regarding pressures we exert on parts of our body during sleep, which cause stubborn conditions of neuritis in the fingers, arms, shoulders and neck.

Miraculous cures have been obtained by persons who have followed the simple rules explained in this book. **$1.50**

THESE PRICES ARE POSTPAID — FOREIGN ADD 25c PER VOLUME.

ORGANIC GARDENING — Emmaus; Pennsylvania

ORGANIC GARDENING

Emmaus, Penna.

Vol. 6, No. 1. Dec., 1944 $2.00 a year 25c a copy

J. I. Rodale, Editor — Sir Albert Howard, C.I.E., M.A., Associate Editor

Table of CONTENTS

With The Editor
Legitimate Means of Checking Insects and Disease 3
The Case For Organic Farming and Gardening 6
Poisonous Fruit Sprays 11
Chilled Seeds 12
Results 13
Fish Food 14
Read Food Labels Before You Buy 16
Hints For The Victory Gardener 17
The Honest Doctors of Cheshire 18
Gathering Leaves 20
Lime For Flowers And Ornamentals 21
Review 22
Lime Requirements 22
Fresh Food And Town Planning 23
Sawdust And Seaweed 24
Fun On Forty Acres 24
Polar Vegetable Gardens 26
Reader's Correspondence 27

With The Editor

Legitimate Means of Checking Insects and Disease

THERE will always be some destructive insects and some disease, but if the organic method is followed it will be down to an irreducible minimum. In our organic garden there is so little of it that we do absolutely nothing about it. There are safe measures however that can be taken to keep the insect front under control. Many people take potato bugs off plants by hand. They readily come off with an easy flick of the hand into a pan below filled with kerosene or other strong liquid.

The earthworm should be assiduously cultivated in the vegetable garden because he eats the larvae of destructive insects. There is definitely a connection between a large earthworm population and a small amount of disease and destructive insects.

A great deal of advice is usually given about the growing of certain plants to drive away certain insects. I haven't had much experience in this field but I have seen references to it so often that there must be something to it. You are told to plant mint near cabbage to repel the moth. The late Dr. Rudolph Steiner of the Bio-Dynamic movement suggested the planting of nasturtiums among fruit trees to reduce destruction by aphids. Followers of the Bio-Dynamic method go a step further. They paint and spray the trees with an extract of nasturtium. About this, Dr. Pfeiffer says in his book, "Bio-Dynamic Farming and Gardening," "Such plantings are effective because the nasturtium contains a strong aromatic substance which also penetrates the ground through its roots. This the trees can take up through their roots and bring into their sap stream, making changes in it

Read Magazine, Inc. Executive and Editorial offices, 6th and Minor Sts., Emmaus, Penna. Subscription rates 12 issues for $2.00. ORGANIC GARDENING, published 12 times a year by Read Magazine, Inc., 6th and Minor Sts., Emmaus, Penna. Entered as second class mail at the postoffice at Emmaus, Penna., under the act of March 3, 1879. Printed in U. S. A

which are imperceptible to us but very evident to the fine organs of smell and taste possessed by the insects. Result: the aphids disappear."

He also states: "Since the cabbage butterfly is repelled by hemp, tomatoes, rosemary, sage or peppermint, it would be wise to use such plants as protective intercrops. The asparagus beetle is repelled by tomatoes, the mole-cricket by hemp. . . ."

"To combat the "capsis-fly" the blossoming tree must be given a highly diluted liquid spray of slaked lime. It is often also advisable to sow or scatter the seed of "attracting plants" to entice insects from plants needing protection. In this way we can use lettuce, spinach and potatoes to combat cockchafer larvae, strawberry weevil, woodlouse, and ear worm. There are many possibilities for helping oneself in such natural ways. For instance, in order to catch snails the empty half orange or grapefruit skins may be laid between the beds with the open side down; after a certain length of time a whole collection of these pests will be found under them."

In another section of the same work, Dr. Pfeiffer discusses tactics against flea beetles. "These are driven away by shade. They prefer a crusty soil, the surface of which, swept by the wind, becomes dry and impermeable. Hence we should work to develop a crumbly soil with strong capillary action, and to make a shade by means of mixed crops and intercrops. We should also mulch the soil between the rows with partially rotted leaf compost. The flea beetle shuns tomatoes and wormwood. It is therefore advisable to plant these at random, here and there, between cabbage or radish plants. Even the spreading of the trimmed off shoots of tomatoes can be helpful."

While on this subject here are a few words of advice issued by the Connecticut Agricultural Experiment Station: "Avoiding the use of ornamental plants which attract pests is one of the best ways to overcome the fungicide and insecticide shortage next season. In place of such insecticide-consumers as roses, dahlias and gladioli, we might substitute phlox, marigold, calendulas and asters, both annual and perennial. Dahlias are troubled by the corn borer, on which nicotine is used. Gladioli are susceptible to thrips, for which the control has been rotenone or tartar emetic. Roses are heir to any number of insects and diseases which call for spraying or dusting at ten-day intervals."

There are any number of suggestions as to how to defeat the actions of the cut-worm. Some advise a ring of wood ashes in a circle around each plant. Soak the ashes which shouldn't touch the plant. Cutworms usually attack beans, brussels sprouts, cabbages, cauliflower, tomato plants, etc. Some suggest putting pieces of board as a trap here and there in the row. Cutworms like to hide underneath boards. Some people make paper collars which they put around the stem so that half of it is above ground and half underneath. These are narrow collars that hug the stem.

Wood ashes spread on the ground will discourage the activities of slugs and snails, although a certain amount of these creatures are to be welcomed as part of the natural life of growing things. Some put wood ashes on cabbage plants to kill disease organisms and insects. It is said that wood ashes on plants will drive away rabbits.

The lower leaves of lettuce are sometimes attacked by a rot which spreads and kills the heart of the plant. This can be prevented by placing clean sand under the plant. For the same reason straw mulches under plants like matermelon and muskmelon prevent rotting from contact with the ground.

A man writes to a garden magazine for advice on how to control cabbage maggots. The best way, the editors advised him, to do it is to plant them in a section that is extremely rich in humus. Cabbages need much more compost than the average vegetable plant. The magazine tells him to take a square piece of roofing paper about 3 inches in diameter. Cut a small hole in the center for the stem of the plant; make a slit from one edge of the paper to the hole in the center for ease in placing the paper under the plant. The paper is left until the plant is harvested. This will prevent the worms from getting onto the plant.

Burns Byram, county agent of Tama County, Iowa developed a chinch bug barrier which can be laid by two men at the rate of about 80 rods an hour. He uses a device that looks like a sled from which paper unrolls and is placed in a ditch made by the sled as it goes along. Baffles throw dirt against the paper as the sled moves. Devices like these do not harm the soil in the fight against the insect plague, because no poisons are used.

A very fine machine has been invented to fight the boll weevil. The inventor is Alex R. Nisbet of Plainsview, Texas. His device consists of a big fan connected to the front of a tractor, which sucks the weevils off the plant into sacks. Hundreds of pounds of boll weevils, bollworms, leaf worms, hoppers, etc., are destroyed from each acre. This machine works just as well on potato plants. He builds the machine

himself and sells them at a price of $275. One user said, "One operation did more good than three applications of poison." Another large cotton farmer who used Nisbet's machine secured a bigger yield from 90 acres than on the rest of his crop on which he dusted poisons.

Developments like this may lead to an interesting battle between mechanical ingenuity and the chemical industry. This is an excellent idea and should be put into extensive use. Perhaps the gardener will be able to run the family vacuum cleaner into the garden and make short shrift of all damaging insects.

According to *Science News Letter* of Nov. 7, 1942, "Very effective control of saw flies is reported by C. S. Noble, Canadian pioneer of subsurface tillage. The grubs are raised and left in a more exposed position, he reports. Tests show that a large percentage of them do not survive.

"Grasshoppers can be controlled by leaving a strip of land unbladed. These are traps. Grasshoppers lay their eggs in the nearest firm soil. Then late in the fall, and again early in the spring, the trap strips are lightly cultivated. This destroys nearly all 'hopper eggs, Mr. Noble declares."

Jeff McDermid, writing in *Better Crops with Plant Food* (Aug.-Sept. 1944) who described Horace Greeley's attitude on insect pests remarks:

"That Greeley was right in surmising that failing soils and woeful neglect of clean culture and sanitation helped to give those ancestors of our present pests a secure and threatening foothold, I need only quote from a treatise on orchard and garden insects, issued two years ago by a Midwest experiment station, which says:

'The number of insect pests will be reduced, both directly and indirectly, by good cultural practices. Insects that live in the soil, such as white grubs and wireworms, are destroyed by plowing; cutworm damage is often reduced by keeping down weeds and grass on which the moths lay their eggs; and some of the fleabeetles are partially controlled by frequent cultivation. Moreover, plants in a thrifty condition will tolerate a moderate infestation of insects without serious injury and will recover more rapidly than unthrifty plants.'"

For controlling the squash bug one publication suggests that the squash be planted very early. The squash borer usually lays his eggs in July so that by early planting the vines become so large and well grown by that time that the borer can do very little damage.

This may open up a new avenue of thought to you. Think in terms of safe methods and leave chemicals completely out of your reckoning. With our typical American mechanical ingenuity we can produce many simple devices which will spell doom to bugs, borers, and the whole family of noxious insects.

The value of bird life in keeping down the insect menace must be given consideration. One cuckoo that was dissected was found to contain more than 250 caterpillars. Don't pollute your grounds with chemicals. Birds do not like it and will go elsewhere. Do everything you can to make the birds feel welcome.

The biological method of insect control is coming into wider use. On a large Florida sugar cane farm there was recently turned loose thousands of frogs shipped in from Argentina to combat insect pests that were ruining the crop. Here is an interesting item: English gardeners make a practice of turning vast numbers of toads loose in their gardens. The average toad consumes daily—or rather nightly—harmful bugs to the amount of three times the capacity of its stomach. Because the toad is nocturnal it is especially effective against cutworms, slugs, etc. Unfortunately, it covers only the surface, and will eat earthworms.

Here is an interesting item from the *Pathfinder*, June 26, 1944. "Now southern cotton planters are standing by while *USDA* engineers plot a war on the dreaded cotton leaf worm with the aid of countless insect eggs imported from Argentina. When hatched, a war-like breed of parasites will invade the cotton plantations in an all-out attack on the leaf worm.

"An Argentinian discovered the parasite was a lifelong enemy of the cotton foe. Later experiments by Harry Parker of the *USDA* proved the efficiency of this means of combatting the leaf worm and mass importation of the insect eggs followed."

You may have heard of the new method of combatting the Japanese Beetle. In Japan there is a disease which attacks the Japanese Beetle in the grub stage. Some of the spores of this disease have been obtained and can be purchased now in powder form. It is being made under license of the U. S. Department of Agriculture. This powder is applied to the soil and infects the Japanese Beetle grubs with "milky" disease. It is said this powder is odorless and is harmless to humans, animals or plants. When the grubs die, their decaying bodies reinfect the soil with the disease. I am not sure whether I would want to eat carrots produced in a soil polluted with milky disease. For grass lawns and ornamentals, this method may be a godsend.

In 1868 California citrus trees

were attacked by the cottony-cushion scale and it threatened to ruin the industry. Government investigators discovered that in Australia this disease was kept in check by lady-bug beetles of a certain species. Some of these were imported and within a few years they ate up practically every cottony-cushion scale in California.

Today in California the mealy-bug on citrus trees are being kept in check biologically by the introduction of certain kinds of lady bugs that are the natural enemy of the mealy bug. The State of California maintains insectaries at sixteen different locations in the state where the lady-bugs are propagated for this purpose.

Late in the summer, some gardeners range far and wide collecting from the tall grass the egg containers of the praying mantis. These they place in their gardens so that in the spring, after the egg clusters hatch, their gardens are fairly teeming with bug destroying mantis.

Perhaps these methods may require a little extra thought and effort. There is a question whether the indiscriminate application of the spray gun is easier. But there can be no doubt as to which is the safest from the standpoint of soil and human well-being.

The gardener who has always sprayed may be skeptical. He may not readily accept our main contention that the continued use of humus as the exclusive fertilizing agent will bring such vigorous health to the plant that there will be less disease and insects. That is to be expected. The sinister and continuous propaganda of the chemical interests has left its mark and mere words in a magazine will not easily erase such a scar.

But there is an intoxicating thrill that awaits such a man or woman, even in his first season of gardening in the organic manner. It is only in the first year or two that he will have to resort to the safe methods outlined here. After that he will safely consign all negative thoughts concerning disease and pests to the limbo of the dust-bin.

J. I. RODALE.

The Case For Organic Farming And Gardening

By SIR ALBERT HOWARD, C.I.E.,

Fellow of the Imperial College of Science

From Country Life (England)

IN the issue of COUNTRY LIFE of February 25 last, Dr. A. H. Bunting puts the case for the continued use of artificial manures in farming and gardening from the point of view of experiment stations like Rothamsted and of the agricultural colleges. His paper reminds me of the kind of lecture I often gave myself to students and others soon after leaving Cambridge in 1899 in order to take up research work on the various aspects of crop production. This research has since been carried out in many parts of the world for over 40 years, during which I have enjoyed exceptional facilities, including 300 acres of land under my own charge, and a considerable degree of freedom. In the course of this long adventure in research, much of which was spent in India, the conventional ideas acquired during my student days on soil fertility were subjected to a series of rude shocks when they came in contact with an ancient system of farming and were put to the acid test of practice. They had to be discarded altogether.

In *An Agricultural Testament* (Oxford University Press, 1940) I summed up my life's work on crop production in the following words: "The slow poisoning of the life of the soil by artificial manures is one of the greatest calamities which has befallen agriculture and mankind." Since these words were written much additional confirmatory evidence has come to hand from all parts

of the world. My views on soil fertility, which are shared by the growing body of pioneers engaged in the reform of agriculture, flatly contradict the findings of the experiment stations so ably and so accurately summed up by Dr. Bunting. The object of this article is to set out the case for returning to the well-tried methods of the past by means of organic farming and gardening in which artificial manures and poison sprays find no place. A minor concession must however be made at the outset. Artificials often appear to succeed for a few years but they never stand the test of time.

THE LONG-TERM RESULTS OF ARTIFICIAL MANURES

How came chemical manures into general use? What has been their effect on crops and livestock?

As is well known the artificial manure industry is largely based on the results of the small wheat plots of the Broadbalk field at Rothamsted which have been under this crop for nearly 100 years. The produce of these small plots, each about half an acre in size, are considered to have established four principles: (1) that wheat can be successfully grown by means of artificials only; (2) that no very striking advantage results from the use of farm-yard manure; (3) that after a time a small but fairly constant yield of wheat can be obtained without any manure whatsoever and (4) that the kind of manuring has practically no effect on the quality of the grain produced. But when these Broadbalk principles are applied to wheat-growing on large-scale mechanised farms difficulties soon arisé. The crop begins to suffer from various fungous diseases—a new and unforeseen factor makes its appearance. This matter was discussed in detail in the Rothamsted Report for 1938 (pages 24-26) but no satisfactory explanation of the trouble was suggested. Further, when the Rothamsted principles are applied to crops like the vine and tobacco, where the maintenance of quality is all-important, another disquieting result makes its appearance—quality is soon lost. Moreover, in tropical crops like sugar-cane, the long-continued use of artificials is followed by the loss of resistance to disease and by the failure of the plant to reproduce itself.

In the island of Barbados in the West Indies, which for many years was almost entirely given up to sugar production and where during the last 40 years artificials have steadily replaced pen manure (a rough type of farm-yard manure), the inroads of virus disease, followed by the loss of reproductive power in the cane, have compelled the Government of the island to seek a free grant totalling £171,810 under the recent Colonial Development and Welfare Act, as well as loans amounting to £40,000 for schemes to develop an intensive system of mixed farming based on animal husbandry. This agricultural plan is warmly welcomed locally as a means of saving Barbados from the evil consequences of mono-crop specialisation (*The Times*, December 24, 1942). In other words the cultivation of the cane by the methods advocated in Dr. Bunting's article have proved a complete failure.

The history of the famous potato-growing area in the Holland Division of Lincolnshire south of the Wash furnishes perhaps the most striking condemnation of the substitution of artificial manures for good old-fashioned muck. Some 60 years ago this potato area was mostly under grass. So rich were some of these pastures that the grass they produced fattened a bullock without any additional provender. When these old pastures were ploughed up for potatoes, the soil was so well supplied with humus that phenomenal crops (which reached 25 tons to the acre) free from disease and of high quality and keeping power were often obtained year after year without manure of any kind. But this did not last. At first it was necessary to add superphosphate, then the potato blight made its appearance and the crop had to be sprayed with compounds of copper. Soon an annual dressing of a complete artificial manure became the rule. The quantity needed gradually increased till it reached 15 cwt. to the acre and even more. Nevertheless the yield, quality and keeping power of the potatoes steadily diminished until crops of 12 tons to the acre are now looked upon as exceptional. To obtain even this diminishing yield the potatoes have to be dusted with poisons as many as a dozen times during the season to keep the blight at bay. But all this is not the end of the story. Two other alarming indications that all is not well have made their appearance. The potato crop has almost completely lost the power of reproduction and a new disease—eelworm—is rapidly spreading. The loss of the power of reproduction in the Lincolnshire potatoes is indicated by the fact that after two or three crops fresh seed has to be imported at great cost from Scotland, North Wales or Northern Ireland so as to give the crop a fresh start. If this is not done the yield falls so low as to be unremunerative. But the eelworm disease goes one better: it puts an end to potato-growing altogether till the fertility of the soil has been completely restored. This

melancholy recital is not due to any lack of organising ability on the part of the potato growers or to want of skill on the part of the local labourers. In both these respects South Lincolnshire is fortunate. It is the direct result of methods of manuring and soil management which are inadmissible.

A similar story could be told of many other crops like the vine, the hop, tobacco, maize, tea, coffee, cacao, the members of the citrus family and indeed of fruit growing generally. The application of Rothamsted principles to farming invariably begins to fail when the original stores of humus in the soil are being used up. Disaster then follows.

The failure of farming with artificials does not stop at the crop. It soon begins to affect the live-stock. Troubles like foot-and-mouth disease, tuberculosis, mastitis, contagious abortion, Johnes's disease and so forth become serious as the fertility of the soil is allowed to run down and substitutes for humus are introduced in the shape of artificials. As chemical manures in this country have replaced muck the tale of animal diseases has increased. When the present war broke out in 1939 no fewer than 12 of the 15 scientific committees set up by the Agricultural Research Council were dealing with the diseases of live-stock and of crops. This constitutes the main preoccupation of the Council at the present time.

SOME FATAL DEFECTS IN THE ROTHAMSTED EXPERIMENTS

What is the cause of all this failure? The answer is obvious when the Rothamsted experiments are subjected to a critical examination. Let us review the wheat plots of the celebrated Broadbalk field.

In the first place a small permanent wheat plot cannot possibly represent any system of farming because it is too small to farm. The half-acre plot is a mere pocket-handkerchief of land firmly fixed in a strait-jacket.

In the second place these small plots were not separated from the surrounding land so as to prevent the invasion of earthworms. The application of artificials either kills earthworms outright, thereby for a brief period adding material of considerable manurial value, or causes the worm to leave the area for a time. But after the first effects of the artificials have passed off the land is again invaded from the surrounding areas. As the volume of earthworms working in an acre of ordinary land weigh about the same as a cow it is obvious how important this earthworm factor is. To reduce it to insignificance it would be necessary to separate small plots of the Broadbalk pattern from the surrounding areas. This was not provided for at Rothamsted.

In the third place fresh seed from the best outside source has been sown every year. Every 12 months the Broadbalk experiments have had a fresh start. Had the seed of each plot been used to re-sow that plot the manurial treatment would have profoundly influenced both the quality of the grain, the resistance to disease of the crop and the power of the seed to reproduce itself. The Broadbalk experiments would soon have collapsed because it is well known from a study of crops such as the vine, sugar-cane, potato, tomato and so forth that plants raised largely by chemical manures not only fall a prey to disease but also lose their quality and also their reproductive power. This grave defect in the conduct of these plots therefore renders all the devotion and care expended on these trials null and void and the results misleading. How such a mistake crept in is difficult to say. It was probably caused by undue concentration on the chemistry of one factor only—the soil.

THE FOUNDATIONS OF ORGANIC FARMING AND GARDENING

The basis of organic farming and gardening is provided not by science but by Nature. If we observe what is going on in any mixed wood, in the prairie or in the ocean and interpret the results with the aid of the biological sciences we speedily discover and also begin to understand the principles on which Nature—the supreme farmer—manages her operations. Mother Earth never attempts to farm without live-stock; she always raises mixed crops; great pains are taken to preserve the soil and to prevent erosion; the mixed vegetable and animal wastes are converted into humus; there is no waste; the processes of growth and the processes of decay balance one another; ample provision is made to maintain large reserves of fertility in the shape of humus; the greatest care is taken to store the rainfall; both plants and animals are left to protect themselves against disease; the varieties of plants do not run out. They are to all intents and purposes eternal.

When we examine in detail the various systems of agriculture which have been devised it will be found that only those like the Chinese, which follow closely the lead provided by Nature and pay the closest attention to the law of return, have survived. When this is done there is no need of artificial manures, of poison sprays to protect the crops, of sera and vaccines to keep the

live-stock alive or of plant breeders to raise a constant succession of new varieties.

During the last 12 years the pioneers all over the world have been actively engaged in the reform of farming and gardening by means of freshly prepared humus. A considerable proportion of this humus has been prepared by the method worked out at the Institute of Plant Chemistry at Indore in Central India and known as the Indore Process. This follows closely the methods of making leaf mould to be seen in any wood where the mixed vegetable and animal wastes are transformed on the ground by fungi and bacteria into humus with the help of abundant oxygen and moisture from the atmosphere.

SOME RESULTS OF ORGANIC FARMING AND GARDENING

The first result which follows the adoption of the law of return is the full utilisation of the unpaid labour force of the soil for providing food materials for the plant. As the humus content of the soil rises so do the numbers of bacteria, moulds and earthworms increase. All these are important contributors of food materials for the crop. For example the work of the nitrifying and nitrogen-fixing groups of bacteria in providing combined nitrogen—the most potent food material essential for crops—is well understood. Both these and indeed all the other groups of bacteria need organic matter. Some of the soil fungi act as a living fungous bridge—by means of the mycorrhizal association—between the humus in the soil and the active cells of the roots by which the digestive products of proteins pass directly into the sap and then into the green leaves. The earthworm is a great soil conditioner and provides large quantities of food materials for plants. The work of Wollny and later of Curtis in the United States shows how important are the casts of the earthworm from the manurial point of view. They are five times richer in available nitrogen, seven times richer in available phosphate and eleven times richer in available potash than the upper six inches of soil. Whenever the active roots of a crop like the potato come in contact with these earthworm casts they surround and penetrate them in all directions in search of these essential materials.

Can humus supply everything the crop needs? Is there any advantage in supplementing humus by artificials? The answer to the first question is clear and definite. In all cases where the soil has received sufficient humus to make it really fertile there is no appreciable response to artificial manures. The maximum yield can be obtained without chemicals. This was one of the interesting results obtained by Mr. A. J. Hosier after he had got the worn-out downland of Whiltshire back into condition by his outdoor method of milk production. When he began operations in 1924 he could write his name on the fields with chemicals. Once they became fertile there was no response even when a complete fertiliser was applied.

Before the condition of real fertility has been reached and insufficient humus or imperfectly prepared humus has been used there is no question that the addition of chemicals does increase the yield. As this state of affairs applies to very large areas in this country it must be conceded that there is a temporary use for artificials. They will enable crop-production to be maintained during the period while the supplies of humus are being increased. While this is in progress a progressive reduction in the amount of artificials used can be made.

If artificials can supplement humus why not be content and make use of such substitutes? The answer to this question is provided by the important principle that what matters most in crop production is the synthesis of protein in the green leaf. When this takes place by means of humus everything goes well—disease resistance, high quality and the power to reproduce the species all follow as a matter of course. Where, on the other hand, a substitute phase in the shape of artificials is interposed in the formation of protein trouble ensues—the power to resist disease, high quality in the produce as well as the stability of the species are lost. Crop-production under these conditions fails.

ARTIFICIALS COMBINED WITH HUMUS

That the use of artificials by themselves or combined with humus are both inferior to humus alone can be demonstrated in a variety of ways. Whenever an area of thoroughly wornout garden or farm land is divided into two parts and the one got back into condition by means of humus the other treated with artificials alone or treated with a combination of humus and artificials interesting differences soon appear. With humus, diseases of all kinds are rapidly reduced to their normal insignificance; high quality produce results and no running out of the variety occurs. Artificials on the other hand are always followed by disease, by low quality and poor keeping power and a distinct tendency for the crops to lose the power of reproduction. Humus spells success, artificials lead to failure.

But perhaps the easiest way of demonstrating the claims of humus is to start a bed of strawberries or raspberries from the most virus-infected and otherwise diseased planting material it is possible to find. When this diseased stock is planted in freshly prepared humus, a remarkable change takes place. Most of the plants recover and throw off the disease; fruit of the highest quality soon results. I recently carried out such an experiment at Blackheath with strawberries afflicted with virus.

Are the supplies of humus sufficient to make organic farming and gardening possible? The answer to this question is most emphatically yes. This will be evident when the appalling waste of potential humus now in progress in this country is realised. The Grow More Food campaign has produced a vast volume of unused straw which can easily be converted into humus by the urine and dung of our existing live-stock and also by the use of crude sewage, both of which are running to waste. All that is necessary is to make use of these valuable activators for humus production. This has already been achieved in this country by a simple adaptation of one of the age-long practices of China. The straw or other vegetable wastes are laid in oblong pits about 3 ft. deep provided with retaining walls of cemented concrete blocks. The floor of the pit is left in its natural condition but is covered with 9 ins. of good fertile top soil. The vegetable matter is then periodically saturated for a fortnight or so with the washings of shippons or piggeries or with crude sewage. Fermentation ensues, the vegetable wastes are then broken down and in the process there is no nuisance of any kind even when crude sewage from the mains is employed. The surplus water drains away slowly after purification by the layer of fertile soil. After a fortnight or so the pits are emptied; the contents are assembled in a suitable compost heap to ripen and the filling and soaking processes are repeated. Three problems are solved by this simple device: (1) huge quantities of additional humus are provided; (2) the surplus straw problem is solved and (3) use is beginning to be made of the valuable crude sewage which now has to be purified and got rid of at vast expense.

Other sources of additional humus are provided by the reform of the temporary ley and the more effective use of green manures and weeds. When all of these are manured with compost or farm-yard manure before ploughing in in the autumn, much additional first-quality humus becomes available for the next year's crop.

The contest between artificials and humus is one which only time and experience can settle. Both systems have their advocates, each supported by numerous disciples. As the years pass the experience of both groups will become known and the issue will be decided by the one unanswerable argument—success.

Another factor in this contest must be mentioned. There is a growing realisation on the part of the man in the street that this soil fertility question involves his birthright—the fresh produce of fertile soil—and that of his children. This interest is bound to lead to action as more and more examples of what properly grown food can do for resident communities like boarding-schools which possess sufficient land of their own to feed their population.

One such example has just been described in the issue of *Sport and Country* of March 17, 1944. More are in the making. When the abounding health and well-being of these communities, fed on the fresh produce of fertile soil, is compared with the C 3 population alongside the need for action will be obvious. The case for organic farming and gardening will need no argument.

Poisonous Fruit Sprays

By JAMES EMPRINGHAM, D. SC., PH. D.

Los Angeles, Calif., Health Education Society

THE following case-histories are records of a few of the many maladies that cause distress in the head.

Mrs. W.O.D., 50 years of age, from the state of Iowa, was a martyr to headache. A physical examination revealed low blood pressure, sub-normal temperature, low hemoglobin and many degenerated red cells showing stippling when treated with Wright's stain. The search was continued to find the underlying cause of these abnormal conditions.

On close inspection of the gums, a faint bluish line, suggestive of lead poisoning, was discovered. The suspicion of plumbism was confirmed by special analysis which revealed traces of this deadly metal in the urine and stool. Plumbism is considered an occupational disease confined to those who are continually in contact with lead, like painters and typemakers. There seemed no reason why this lady should have this malady.

Questioned about her diet, the patient said she was a "food-reformer," and very fond of spinach, lettuce, and all leafy salads. When making apple pies, she always washed the fruit and ate the parings to secure the vitamins and minerals that abound in the peel.

We told the lady that water washing would not get rid of the invisible lead arsenate with which orchard and garden produce is generally sprayed and we showed her the scientific way of removing every trace of these poisons. Then the patient was put under a course of treatment to eliminate the injurious minerals from the tissues and bones.

In process of time, the woman's blood-pressure, red corpuscles and hemoglobin returned to normal and headaches troubled her no more.

We might cite many cases and all sorts of ailments that have been scientifically proved to be caused by insecticides, especially in states where there are no laws regulating such spraying.

For example, Mrs. C.L.S., 53, a constant sufferer from headache was given a complete examination. Nothing pathological was found except sugar in the urine, which of course suggested diabetes. Further tests indicated that this was the malady that caused cranial discomfort.

The body is a sugar engine. Starches and all carbohydrates must be transformed by the liver into glucose before they can generate heat and energy. But just as gasoline will not explode without a spark, so the fuel of the body cannot be burned without insulin. When the pancreas fails to produce this hormone, the unoxidized sugar does damage and is filtered from the blood by the kidneys. This condition is called diabetes and formerly always soon ended in death. But today insulin from the pancreas of an animal is injected into the diabetic patient and this borrowed hormone does the same work as the secretion naturally generated by the human body.

The modern efficient doctor does not rest when he has discovered that a patient has diabetes, cystitis, or some other malady. He continues his search until he has found the reason for the abnormal condition.

In the case of Mrs. C.L.S., as so often happens, arsenate of lead, taken over a long period with the skins of fruits and vegetables, was proved to be the underlying cause of her ill health. Whichever organs are congenitally weakest are always the first to break down. So in one victim, lead poisoning brings about anemia; in another, gastritis; in a third, the pancreas fails and diabetes results, and so on.

Mrs. C. L. S. was at once put on a regular course of insulin and special treatment to counteract the insecticide in her system was begun. The headaches disappeared and today the patient declares she is perfectly well, although her pancreas has been so badly damaged by arsenate of lead that it cannot make insulin

and she will have to depend on lower animals to supply her body with this secretion so long as she lives.

Poisoning by insecticides may injure any and every part of the body, and it is an awful fact that health enthusiasts are most liable to be harmed. They eat fruits and vegetables to obtain essential minerals not knowing that the metals they are most certain to get are the deadly arsenic and lead.

Unfortunately, these poisons do not always give any sign of the insidious damage they are doing. So the cause of the illness and death that in many states is engendered by produce from sprayed orchards and gardens, is entirely unsuspected by the victims whose health is gradually undermined.

Until effective insecticides, harmless to humans, are discovered, we should have rigidly enforced laws compelling growers to remove every trace of spray before vegetables and fruits leave the land where they were produced. In the meantime, housewives must be taught how to get rid of these poisons so that no contaminated food comes to the table.

For information on how housewives may rid foods of these poisons, see the following items:

Fortunately, the consumer can make fruits and vegetables perfectly safe with little trouble or expense; no matter how loaded they may be with poison. However, merely washing with water accomplishes little.

Such fruit as apples and pears should be washed in 1½% solution of hydrochloric acid in salty warm water. This acid is normally in the stomach and quite harmless when diluted, but it injures the teeth, so rinse fruits well. Wooden vessels must be used. Lard tubs are ideal. To each quart of water, add seven (wooden) teaspoons of acid and three teaspoons of ordinary salt. Keep the fruit agitated for a minute, then rinse in running water. The same solution may be used again many times. In addition to washing, the stems and calyxes should be cut off.

Peaches, apricots, and tomatoes should be peeled after the acid washing. For these soft skinned fruits the acid solution must be weaker—not more than three teaspoons of acid to a quart of lukewarm water.

Pea and bean pods should be washed before shelling, but not the kernels. Stringbeans must be well acid-washed.

Fruits and vegetables should be brushed while being acid-washed. (Avoid breaking the skins).

Carrots are seldom sprayed but thorough cleansing is necessary because foreign-born gardeners fertilize with human excreta, sometimes infected with typhoid.

It is impossible to acid-wash spinach. Therefore, use lettuce. It has all the good qualities of spinach and no oxalic acid.

Care must be used not to spill the undiluted acid as it burns severely. If it gets on the hands, wash with running water and then apply baking soda.

Chilled Seeds

Nature came to the aid of farmers and cattlemen in Texas, doing something which hay producers had been trying to do for years—increase Hubam clover yields.

A sudden freeze on the Luling (Tex.) Foundation Farm resulted in a heavier clover stand after the first crop had been killed. Acting on that cue, Farm Manager Walter Cardwell began freezing clover seed in a food locker, then planting it, getting the increased yield.

He explained: Heavy coats of dormant seed are broken by the freeze. Planted after being frozen, the stand is much heavier and the growing season shorter.

Next step to increase the crops, he said, is development of a machine which will 'scarcify" the coating of the clover seed before planting.

Midwestern farmers have had similar experiences with oats, which, sown early, commonly outyield later plantings.

Scientific explanation of this is found in the work of Prof. N. Maximow, Russian plant physiologist.

Prof. Maximow exposed seed grain to temperatures of 42° Fahrenheit, or 10 above freezing. The stalks headed out earlier than those from seeds sprouted at a warmer temperature. This was true even when the early chilling period lasted only for a few days and the two lots of grains were grown at the same temperature until maturity. It was found this treatment held good for all plants that have a late ripening period.

The experiment gave scientific support to an old Russian folk saying: "If you want to grow rich fast sow your oats in the mud." It has long been held by the peasants that the best time for sowing oats is while the fields are still muddy (and hence chilly) from melting snow.—*Pathfinder.*

RESULTS

I've done organic gardening for years and never have pests of any kind, not even potato bugs.

Mrs. Thomas Swanton,
Webster, New York.

—o—

The School of Horticulture, at Ambler Pennsylvania, started making compost heaps by the Sir Albert Howard process last year. This year they tried an interesting experiment on a crop of oats. One-third of the acreage was manured with compost only; one-third with manure and one-third with manure and commercial fertilizer. I visited the field this spring and it was thrilling to see how superior the section of the field was that had received the compost treatment. Here is a letter from the director of the school:

Sept. 5, 1944.

I am so sorry to have to report that we do not have accurate records of the yields of oats on the fields where the compost was used. The crop was harvested with a combine and it was impossible to keep separate records as the machine encircled the field. We do know, however, that the growth was much better on the section where the compost was applied.

With appreciation of your interest,

Very sincerely yours,
Louise Bush-Brown,
Director.

Oct. 10, 1944.

Mr. J. I. Rodale,
Emmaus, Penna.
Dear Sir:

I have been interested in organic farming for several years. Your magazine has been of great interest to workers here at the Sanitarium. Our institution follows the plan of helping people to learn the laws of nature so that they can get well and stay well.

Sincerely,
Neil Martin,
Florence, Alabama.

—o—

Mr. J. I. Rodale,
Emmaus, Pa.
Dear Mr. Rodale:

Enclosed please find a check for another years subscription to Organic Gardening. This method of gardening is certainly championing the growing of better food. *Also this is the type of gardening that 90% of the Danish farmers used and my Dad was one of them. I can readily understand now, why Danish butter was in such demand in England.* Our cattle were all raised on organic grown fodder. The results being dairy products of superb flavor and quality.

A few years ago, I purchased a tract of land of about 2 acres in Mountainside. It is here that my wife and I are fully enjoying the open spaces, and our hobby of flower gardening. For the past few years we added a good sized victory garden to our pleasures. Organic Gardening magazine entered into our plans, giving us many helpful suggestions. Heretofore we had been using chemical fertilizers, the results were fair where quantity was concerned, but the vegetables lacked flavor. *This year I followed faithfully organic gardening methods. My harvest up to date has been abundant in flavor, quality and quantity. I have never had such healthy looking crops both in the flowers and vegetable gardens. My thanks to Organic Gardening.*

Sincerely yours,
Thomas Lauster,
Mountainside, N. J.

—o—

DEFINITION OF HUMUS

The following, by P. J. McKenna, President of the Men's Garden Club of New York, in "The Home Garden" gives one of the best definitions of humus and organic matter we have seen:

"Organic matter and humus are terms so loosely used that often there is danger of their being taken as synonymous. They are not interchangeable. Organic matter is one thing, humus is another. The former, so far as the soil is concerned, is any raw material, animal or vegetable, such as manure, garbage, leaves, even sawdust, to use a few examples. When these raw materials (either in the soil or when stacked) are decomposed, when the identity of the original material has disappeared and all that remains is a soft, dark, odorless substance, then—and not until then—it becomes humus. The change (decomposition) is brought about chiefly through the action of microscopic life, in the form of bacteria."

FISH FOOD

By H. C. HAAS

Part I

THE U. S. Department of Agriculture has circulated at the price of ten cents to farmers a 22 page pamphlet entitled "Farmers' Bulletin No. 1938 — FISH FOR FOOD from farm ponds" for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. This seeks to show how in one year, with a suitable location, enough area (about one acre of water surface to each farm family) proper depth, an adequate water supply, adequate drainage, a well built dam, proper deepening at the edges, removal of unwanted plant growth, proper stocking and "*proper fertilization*", there can be produced a pond that will yield about 50 pounds of bass and 175 pounds of bream, all of the desirable "pan size", annually per acre of water surface.

The reader is referred to the bulletin for information on all these many items. We shall here describe only how it is recommended that the fertilization be done.

Here is the OUTPUT annually for each acre of pond surface:

225 pounds of edible, healthy and delicious fish (page 8), yielding vitamins and other valuable food elements; also the wholesome recreation of fishing.

Here is the INPUT annually for the same pond surface:

800 to 1000 pounds of chemical fertilizer, satisfactory results not being obtained with an insufficient amount (page 10). For those mixing their own fertilizer these ingredients are recommended (page 6):

267 to 333 pounds of sulphate of ammonia.

400 to 500 pounds of superphosphate (16 per cent).

33 to 42 pounds of muriate of potash.

100 to 125 pounds of ground limestone.

800 to 1000 pounds total.

It is not emphasized anywhere in the pamphlet that any organic matter or any other desirable input is required. In fact it is stated that cottonseed meal, hay, manure and other *organic materials have not been found satisfactory in the Southeast for fishpond fertilization.* It is stated also that *all kinds of water weeds,* (such as cattails and waterlilies which emerge from the surface, and "mosses" which remain submerged), *should be kept out* because they foster malaria-carrying mosquitoes, keep the bigger fish from finding the little ones, making the catch too small, and interfere with fishing. All tree stumps, brush and leaves are to be burned or otherwise removed from the pond or from within fifteen feet of it.

Water, sunlight, perhaps some carbon dioxide, and the chemicals! That's all you need to make delicious and healthy fish! Fish have proteins, fats, niacin, and vitamins A, B, and C. You get these all! (page 1). Try it in your bathtub, or in a tank out in the sun. Put in the chemicals in proportionate quantity. The fish you get do not eat the chemicals. They eat a "tremendous growth of plants so small that they can be seen only with the aid of a magnifying glass", changing the color of the water, — this growth resulting from the introduction of the chemicals. Put in some goldfish and watch them thrive! If you believe that, you'll believe anything.

Has anybody thought that the vitamins, proteins and fats are complex carbon compounds, containing not a litttle but a great deal of carbon, and that these are unobtainable from the mixture above described? Yet your government says it has been done, by a certain Agricultural Experiment Station. We question the quality of the fish. We shall believe they got some pan size fish, and that this has not been totally armchair experimentation. Weren't there produced at the New York World's Fair the biggest tomatoes ever, on the highest plants, using only water and selected chemicals! Hydroponics, used for phenomenal plant growth before, and now used to grow fish! Big! Pan size fish where we had minnows!

Who in New York and other parts has not tasted those insipid winter tomatoes, mass produced in the same part of the country as these experimental fish, lacking color, taste, vitamins, richness, and all that good tomatoes and fish should have, but as much alike in their fancy cartons as peas in a pod? Beautiful colored pictures on the outside of the box, but with food inside as tasty as bicarbonate of soda! And, because we eat such food, we get headaches, and common colds,—our resistance is lowered, and we get all the other things that are filling the hospitals and making 4F's. For the headaches and colds we put chemicals of another selected kind into our stomachs. These, added to the chemically produced foods, square the effect; the doctors revel in increased business, and can confine their aid only to the privileged few, who have the most of what doctors value, and everybody else values too. True, we want jobs, for doctors, for the many thousands in the drug business, and in the chemical fertilizer business, and in the vitamin business and others that fill the drug stores, but we do not want all these to sit in at the wake of the human race!

We want of course the tremendous growth of plants in the lake, the so-called "plankton" which normally fill the rivers, lakes and oceans to varying density. But this cannot be produced with raw inorganic chemicals, most of them poisonous, except in high dilution. Other means, the time honored means of nature, can produce the richest plankton, healthiest for fish, and for those who consume the fish. The organic plankton, myriad in kind, both vegetable and animal, lower in the stage of evolution than most of the forms of life that we see, demand for their growth and existence, just as do the bacteria and earthworms of the soil, their quota of organic matter, added to the water, the excreta and remains of the fish in the pond, the droppings of the birds that fly over it, the contribution of the hundred or more other kinds of small animals that come to the lake for water or live in it, the insects, whose size is small but contribution large because they are so numerous (Let's encourage all enemies of the mosquito, not kill them!), the organic matter washed in by brooks and springs; the leaves and seeds blown upon the water from surrounding trees, and, no small contribution, the dust from the sky, laden with pollen, if the surrounding country has not been too much robbed of its organic cover by fire or uncompensated crop removal. The lake surface is broad and it can take in a great deal, twenty-four hours a day, and more when the winds blow.

A half ton of chemical added annually to each acre of water cannot take the place of all this. America needed no chemicals in the pioneering days, when everything that grew had all the vitamins already contained in most suitable form and quantity—no pills needed. Organic cover, around the lakes and elsewhere, is disappearing, a little each year, so slowly that we cannot see it, as unobvious as the movement of a clock's hands. As our forests

Reference (a)

get burned away (26,571 *incendiary* fires in the U. S. in 1942 on *protected* lands reported by the United States Forest Service, and many more accidental fires) and have wood taken out of them for industrial purposes faster than it can grow with no organic return from the cities and factories, as the crops from our fields, food, cotton, tobacco, and raw materials for the factories increasing in amount every time someone finds and develops a new material having unique properties and requiring cellulose or the like, with no organic return for all this, as the organic life in our topsoil and the birds and small animals of hundreds of kinds are being killed by the deadly arsenate of lead, making the ground that receives it permanently poisonous, other poison sprays and NPK not so deadly but doing the same thing, being larger in quantity, as our topsoil gets washed by floods and erosion into the rivers due to wrong plowing and the inability of the soil to perform its normal job of soaking up even a heavy rain on a steep slope and holding it like a sponge, its organic substance gone and some plowed under; as all this loss takes place on the land around the ponds, *the ponds also share the loss.*

In Part II, we will show with a number of examples the difference in health giving properties between foods grown on land and foods grown in the ocean, the former too often with chemicals, and the latter without mined chemicals added by man. Food in the sea is grown now just as it was a thousand years ago. Man has not been able in the sea to cause the vast changes he has brought about on land. Even in the sea he has very recently made slight attempt to use chemical fertilizers. A university professor has written that

Reference (b)

"chemical nutrients have been used for oyster culture in Norway, and the same gentleman looks to "the possibility of improving (?) sea fisheries" by this means. He quotes the U. S. Department of Agriculture method used on the ponds and really wants to pour chemicals into the

North Sea! Let us hope this will never come about. We have dosed the land enough with chemicals, and don't want to poison the ocean too. The idea is foolish anyhow, because the seas are of such great volume that a very large and expensive quantity of chemicals would not appreciably increase the amount already there. Sea water is said to contain all the chemical elements, many highly diluted, the compounds also highly diluted.

REFERENCES

(a) "How Bare is Mother Nature's Cupboard?" By W. B. Greeley on page 39 of the August 1944 "Tomorrow"—Creative Age Press Inc., 11 East 44th St., New York 17, N. Y.

(b) "Science and the Fisheries." By Prof. James Ritchie, Department of Zoology, University of Edinburgh, printed in "Nature"—August 26th 1944, Vol. 154, No. 3904, p. 275.

— To Be Continued —

Read Food Labels Before You Buy

Hygeia Writer Warns That If The Contents Contain Sulfur Dioxide Or Benzoate Of Soda They May Be Inferior Products

"READ the labels on your food! If they contain either sulfur dioxide or benzoate of soda you may rest assured that they are inferior products, because properly processed foods do not need chemical preservatives," Evan Wright, Director of the Food and Drug Division, Kansas State Board of Health, Lawrence, Kansas, advises the housewives of America in *Hygeia, The Health Magazine* for November.

He points out that the better food manufacturers get along without chemical preservatives, which is sufficient proof that they are not necessary.

"We have," he says, "every type of preservation needed to obviate the use of harmful chemicals. Yet on the shelves of any grocery store in the country you may find molasses, cherries, raisins, figs, marmalades, dried bananas and other dried fruits containing sulfur dioxide. . . .

"There is a seeming inconsistency in the fact that the federal standard for catsup excludes the use of benzoates, while the standards for jellies and preserves permit its use in these products providing it is declared on the label. Should the millions of Americans who eat their meals in restaurants be prohibited from eating benzoates in their catsup without their knowledge but permitted to eat it in jellies or preserves even if the packages from which they are removed in the back rooms of the restaurants bear the labels which say, 'contains benzoate of soda, a preservative'?

"Much of the dried fish on our markets just before the war had its surface sprinkled with boric acid. It is true the labeling of this type of fish declared the use of the acid and gave directions for its removal. The sad fact is that a considerable portion of the acid could not be removed from the fish by following the directions. It is probable that when dried fish again becomes a common item in our stores we will again see much of this chemically treated sea food. It is peculiar that the companies packing dried fish pack two types; one without boric acid for sale in states which prohibit its use, and another type for sale in the states which are not so particular. . . .

"What can be done about this unfortunate situation? You can read the labels on the foods you buy. Your personal boycott of all chemically preserved food and that of every thinking consumer will do more than anything else to prevent the use of these harmful chemicals in our foods. . . ."

Hints For The Victory Gardener

This is the twenty-fifth of a series of articles by this author dealing with the cultivation of ordinary vegetables.

By ROGER W. SMITH

OKRA

ALTHOUGH its popularity has greatly increased in recent years, this interesting and valuable plant is still little known to many gardeners. It may be grown under conditions suitable for tomatoes and cucumbers, and many ambitious Victory gardeners are now growing it in northern gardens.

Okra is indigenous in Africa. You will find it unlike most of the ordinary garden vegetables. Clemson Spineless (56 days to maturity) forms an upright plant bearing large hibiscus-like flowers and a heavy supply of edible pods.

Any good garden soil is suitable for okra although its rapid growth is encouraged by an abundance of quickly available plant food. A warm, rich soil to which ample quantities of compost humus have been added is ideal.

Just as soon as the ground has warmed up seed may be sown in rows four feet apart and the plants thinned to stand not closer than two feet apart in the row. If you have a coldframe you will get your plants off to an early start. But in any case, every effort should be made to encourage vigorous and healthy growth. A mulching of sifted organic humus placed around the young plants will produce steady, luxuriant growth.

The large flowers usually open during the night and fade the following day when the unripe seed pods will be ready for gathering. These pods should be gathered daily to prevent them from maturing, regardless of their condition. A few old pods left on a plant soon exhaust it and prevent the formation of a further crop of edible pods.

One ounce of seed should be sufficient for fifty feet of row and fifty feet of row usually produces at least five hundred pods —a sizeable crop. Thus you will be faced with the problem of how best to conserve the excess. Many methods are in use. Perhaps the simplest way is to string the yound pods on coarse thread and hang them to dry in some suitable place. In some countries many tons of pods are preserved in this way.

Okra, often known as "gumbo" when it reaches the kitchen, has a peculiar flavor. You may not enjoy this flavor at first because of its strangeness but will doubtless quickly acquire a liking for it. Okra is a valued addition to the diet because of the nutritionally important minerals it contains. It is a good source of phosphorus, calcium and iron and grown under healthful organic conditions has increasing value.

But whether you cultivate a few short rows of okra because of your fondness for "chicken gumbo" or whether you try the plant experimentally in your garden, and marvel at its wide flowers and general strangeness, your experience at first meeting this valuable plant will be a memorable one.

The Honest Doctors of Cheshire

A British medical experiment to prevent ill-health

By PHILIP NORMAN and JAMES RORTY

Reprinted from The Commonweal

A FEW MONTHS after Munich, with Britain frantically preparing for war and appalled by the prevalence of malnutrition and disease revealed by the examination of her first draft registrants, a committee of English provincial doctors issued an historic document.

The committee represented the 600 "panel" health insurance doctors of the County Palatinate of Cheshire, a county of mixed agriculture and industry, famous for its cheese, and for Lewis Carroll's smiling cat. After a quarter of a century of medical benefits under the National Health Insurance Act, the Cheshire doctors had met together to appraise its results. Had the Act fulfilled its stated purpose: "The prevention and cure of sickness"?

The Committee delivered its verdict on March 22, 1939, in what is called "A Medical Testament." The report was unanimously adopted by an audience of 600 persons representing the County of Cheshire, the County Council, the medical profession and the National Farmers' Union.

To the question of cure, the Committee answered "Yes." The average expectancy of life had risen in Cheshire since the passage of the Act, and much of this, they thought, was due to the fact that, once doctors were paid an annual per capita fee for every patient under their care, the poor people could and did call their physicians whenever they needed them, instead of waiting until they could afford the doctor's visit, or until slight illness became serious.

But to the question of prevention the Committee answered flatly, "No."

On the first and major count (prevention) the Act has done nothing. We feel that the fact should be faced. Our daily work brings us repeatedly to the same point: "This illness results from a lifetime of wrong nutrition."

Among the consequences of this wrong nutrition, the Cheshire doctors reported anemic mothers and sickly infants, bad teeth, rickets and constipation—the last named, in the opinion of the Committee, giving rise to "a substantial proportion of the conditions for which our aid as doctors is sought."

Nutrition and the quality of food are the paramount factors in fitness. No health campaign can succeed unless the materials of which the bodies are built are sound. At present they are not. Probably half our work is wasted, since our patients are so fed from the cradle, indeed from before the cradle, that they are certain contributions to a C 3 (sickly and below par) nation. Even our country people share the white bread, tinned salmon, dried milk regimen. Against this the labors of the doctor resemble those of Sisyphus.

This is our Testament, given to all to whom it may concern—and whom does it not concern? We cannot do more than point to the means of health. Their production and supply are not our function. We are called upon to cure sickness. We conceive it to be our duty in the present state of knowledge to point out that much, perhaps most of this sickness is preventable, and would be prevented by the right feeding of our people. . . .

Remember, this is the British equivalent of our county medical societies speaking. And the year is 1939. In that year most of our county medical societies were busy fulminating against the threat of "socialized medicine," meanwhile taking steps to rub out competition as it appeared in

the from of group practice organizations and medical cooperatives. Because the steps taken by the District of Columbia Medical Society and the American Medical Association with respect to Washington's Group Health Association were a bit too rough, in the opinion of the Department of Justice, both organizations were indicted and convicted under the anti-trust law and eventually the Supreme Court sustained the conviction.

* * *

As for the new science of nutrition, comparatively few American doctors knew much more about it than the average layman. In 1939 only three or four medical schools gave courses in nutrition. The average physician had picked up what little he knew from his hospital dietitian. And since both the menus and the kitchen techniques of many if not of most hospitals were still deplorable from the nutritional point of view, that wasn't a great deal.

Not that we didn't have plenty of undernourished and malnourished people. Almost any county medical society that had wished to look for nutritional trouble, and to testify about it, could have found plenty of it right at home. Four years before, a study by the Bureau of Home Economics had revealed that in scores of counties, both urban and rural, the diet of the average low income family was as bad or worse than the white bread, tinned salmon, dried milk régime against which the authors of the Testament inveighed, and the resultant malnutrition was just as serious.

The point, of course, is that in our seizure of the huge health potential offered us by the findings of nutritional science, we are still at least a decade behind the British. And until the reasons for this lag are fully grasped by both physicians and laymen, we are not likely to close the gap.

The Cheshire doctors were right in saying that the National Health Insurance Act had not helped directly in the prevention of illness. Indirectly, however, its effect was considerable. For under the provisions of the Act they were obliged to treat people rather than illness. Each of the 600 doctors on the Cheshire panel was paid so much a year per capita for the care of the patients in his charge, the number being limited. An increase of sickness among his panel patients brought no increase of income to the doctor. It meant only more work and less sleep, whereas less sickness meant more leisure for study and recreation, as well as a better chance to supplement his income by attending, on a fee-for-service basis, the middle class and upper class patients not covered by the Act. Having thus acquired a vested interest in health, the doctors proceeded to do something about it.

For the Cheshire doctors did more than merely utter a cry of desperation and defeat. Their Testament reports systematic and successful attempts by panel doctors not merely to improve the diets of their patients, but to reconstruct the whole food economy and food culture of the villagers they served, all the way from the kitchen to the soil on which the food was grown. They taught the village bakers how to make bread from whole wheat flour, reinforced with half its weight of raw wheat germ. The flour was freshly ground—within 36 hours—in a local hammer mill from "fertility" wheat grown locally and fertilized by the Indore humus methods developed by Sir Albert Howard. Here is the diet prescribed for pregnant mothers:

Wholemeal bread, 1 to 2 pints of milk (raw), generally including half a pint at breakfast taken with porridge (medium oatmeal scattered into boiling water and stirred until it thickens); eggs are used freely; salads in abundance, including celery and dandelion leaves; green leaf vegetables plunged into boiling water for 5 minutes and eaten with butter or poached eggs—or with meat, but the amount of meat taken is very moderate; liver weekly; herring once or twice a week except on herring days; fruit in abundance. The evening meal is often begun with soup of the Scots broth type, but carrots, unpeeled, are grated into it just before serving. Apples are eaten in their skins or baked in their skins, and other fruit is used freely. Potatoes are baked in their skins or boiled in their skins (dropped into boiling water and boiled till they "smile," then the water is poured off and a crumpled cloth put in the pot whilst it is drawn to the side of the fire). Cheshire cheese, grated into a salad, is advised and is popular. . . . . No patent or "processed" food of any kind whatever is employed, with the exception of Marmite and of dried yeast. Broth, red gravy, brains and marrow bones are used for the children from 9 months onwards.

Health flowered in those villages.

With rare exceptions, and those almost always "strangers," the mothers feed their infants at the breast 9 months and then wean them for a year or a little more. The nursing mother's food continues as in pregnancy, including the greens and salads. . . . The children are splendid. As infants they sleep as well as could be wished, grow well, are not over fat but weigh well and very

seldom "ail anything." Bronchopneumonia, for example, is almost unknown among them. One of their most striking features is their good humor and happiness. They are sturdily limbed, beautifully skinned normal children. It is not desired to give the impression that the child population of this village is perfect, or that complete compliance with the dietary advised is secured even amongst all who attend the center; but it is a fact that the mothers follow it substantially and with good results, which those concerned think they recognize. .

It is important to note, first, that this and similar demonstrations were conducted on their own initiative by local groups of private physicians, without benefit of government or foundation subsidies; second, that they involved a deliberate break with the existing commercially developed food economy and a re-education of food suppliers as well as food consumers; third that both in their practice and preaching these Cheshire doctors were expressing a revolutionary attitude toward their own profession and its responsibilities. Disillusioned and impatient with the endless repair mechanics of therapy, they had turned, with something like religious enthusiasm, to the building of health.

This radically changed attitude has been steadily gaining ground among British doctors for nearly a generation. It is climaxed by the aggressive and far-sighted rôle played by the British medical profession during the war. To the British nutritionists, both the physicians and biochemists, must be given much of the credit for abandonment, after a brief trial, of the relatively inadequate, wasteful and expensive bread and flour fortification program and the adoption of the National Wheatmeal loaf; also the National Restaurants and other basic nutritional advances achieved by the British Food Administration.

On the average, the British people have been better fed during the war than ever before in their history. As a result they have also been healthier. Despite the *blitzes,* despite long hours on the production line, despite overcrowding, despite the cumulative strain of intolerable worry and grief, the most critical health statistics of the British population have shown an actual improvement.

Watching from this side of the Atlantic this amazing reversal of what might logically have been expected, we have wondered how and why. The Testament of the honest doctors of Cheshire had a good deal to do with it. But what lay back of that document had more.

Gathering Leaves

The enclosed is an item from the Allentown Morning Call of Oct. 17, 1944 *which shows how effectively the Street Cleaning Department of Allentown, Pa. cooperates with the gardeners of that city*:

"Arthur Frank, superintendent of street cleaning, announced that the annual leaf delivery service to Victory Gardeners who use them for compost purposes, started yesterday. Many orders are already on hand.

"The leaves, cleared from the city streets daily by a squad of trucks, are delivered to the garden sites free of charge. They are spread as a compost to rot over the winter months and serve as a fertilizer base for the gardens next spring.

"The practice has been followed by the city for years, and officials are only too glad to put the leaves to good use. Otherwise they would be carted to dumps, not advisable because of a fire hazard, or destroyed in the incinerator.

"Collection of leaves was started several weeks ago, but delivery to gardeners on a large scale was not started until yesterday because the early fall contained too much paper and other dirt matter. Now, however, the leaves are considered clean enough for garden purposes.

"A fleet of four trucks, each gathering an average of three loads per day, scours the city to pick up the fallen leaves. A normal day's take is approximately 100 cubic yards of leaves, according to Frank. The season will continue from now until the end of November, unless frequent frosts or cold rains rush the fall.

"Only lament by Councilman Henry Bauman, director of streets, is the fact that there aren't enough leaves to go around. The city always receives more requests than can be filled. Deliveries are made on a first come, first served basis."

Lime For Flowers And Ornamentals

Reprinted from a bulletin issued by the National Lime Association

(Bulletin 180-A)

FLOWERS, shrubs, and trees, like lawns and field crops, grow best in the proper soil medium. Cultural methods vary considerably as do plant food requirements. As a general rule, however, a deep rich garden soil produces best results. There is a wide variance in the ability of flowering plants and shrubs to tolerate soil acidity. Many of the more common ones prefer a soil which is neutral or only slightly acid.

The following list, based on field observation and controlled experimental work, includes only those plants which are found most generally in home gardens. For convenience, they are divided into three groups as follows:

1. Some Plants Preferring Soils Approximately Neutral:

Abelia	Clematis	Larkspur
Alyssum	Columbine	Lilac
Anemone	Coreopsis	Mockorange
Arbor Vitae	Cosmos	Narcissus
Aster	Dahlia	Pansy
Begonia	Deutzia	Peony
Bell Flower	Forsythia	Poppy
Box, common	Geranium	Primrose
Bittersweet	Gladiolus	Privet
Butterfly Bush	Hibiscus	Rose
Calendula	Honeysuckle	Spiera
Canna	Hyacinth	Tulip
Carnation	Hydrangea	Violet
Chrysanthemum	Iris	Wisteria
	Ivy	Zinnia

2. Some Plants Preferring Slight to Medium Acidity:

Aster, some varieties	Juniper	Phlox
Bunchflower	Lily	Pine
Fir	Lily-of-the-Valley	Spruce
Heather	Magnolia	Willow, creeping
Holly	Oak, red	Wintergreen
Huckleberry		

3. Some Plants Requiring Medium to Strongly Acid Soils:

Arethusa	Orchid	Sandmyrtle
Arnica	Pink Ladyslipper	Sundew
Azalea	Pitcherplant	Trailing Arbutus
Ferns, most varieties	Rhododendron	Trillium
Galax	Rose Pogonia	Wild Calla
Gardenia		

For plants of the first group, the acidity of the soil definitely should be corrected with lime. It is difficult to prescribe the exact amount to use, as some soils are more acid than others. However, if lime has not been applied recently, a safe application would be ½ to 1 pound of hydrated lime to 10 square feet of area. This should be thoroughly worked into the soil with hoe or rake.

Only the more acid soils need lime for plants in the second group, and those of the third group prefer distinctly acid soils and require no lime.

REVIEW

"This Plot of Earth"

By H. J. MASSINGHAM (Collins, Price..... 12/6).

A book is a revelation—may be the revelation of a truth, most certainly the self-revelation of the writer. And when a gardener writes about a garden, the revelation is complete.

To Mr. Massingham, the garden is the key of life: it is the door to sanity and right living: it provides man with bodily sustenance, proving his unity with the soil: and it opens his thoughts to ideals which prove him one with the stars. A man in a garden is the image and reflection of mankind in the universe.

"By Death, as by life, are we fed" sang George Meredith, and Mr. Massingham takes the literal application of this poetic truth. The compost heap dominates this book, for it is the condition of soil fertility and hence of life. It plays a part of the utmost significance in human economy for it "balances the cycle of life and decay, and decay and renewal like the hub to the wheel."

Starting from the compost heap as a generating station of humus, Mr. Massingham dwells on the resistant qualities it confers against drought, disease and ultimately against soil erosion. The paramount importance has gained increasing recognition following on Sir Albert Howard's exposition of the Indore method of maintaining soil fertility, and a number of publications on this subject have recently appeared.

But a distinctive feature of Mr. Massingham's contribution to this all-important theme is his urgent appeal to the small man to cultivate his garden patch in the right way by compost and not by artificial manures. Every gardener who utilizes to the utmost the principle of self-sufficiency, is actively and effectively protesting against the corrupt system of big business and big money which threatens to deprive the land of fertility as it has deprived our bread of the vital wheat germ. A nation of such gardens, however, insignificant the individual holding, could force the realisation "that we are trustees of our native land and stewards of the earth, and we are Englishmen with an historical sense of individual liberty."

In developing this subject, Mr. Massingham ranges far and wide. The book is an inexhaustible quarry of facts and implications. This is no text book on gardening. It is scarcely a Gardener's Chronicle, notwithstanding the sub-title. It is a philosophy of life, based on the text of a garden. The separation of man from the land has generated "an unhappy, rootless, restless being." To regain integrity, the wholeness of living which is the same as holiness, man must dig his roots afresh in his active soil.

Frances Prewett.

Lime Requirements

VEGETABLES THAT NEED A LIBERAL AMOUNT OF LIME

Cauliflower, muskmelon, martynia, broccoli, parsnip, asparagus, onion, beet, leek, celery, spinach and lettuce.

VEGETABLES THAT NEED A MEDIUM AMOUNT OF LIME

Carrots, kale, tomatoes, cucumbers, peppers, cabbage, pumpkins and peas.

VEGETABLES THAT NEED A MODERATE AMOUNT OF LIME

Corn, rhubarb, endive, kohlrabi, Brussels sprouts, dandelion and beans.

VEGETABLES THAT SHOULD HAVE NO LIME

Watermelon, squash, turnip, radish, potato, and parsley.

Fresh Food And Town Planning

An address by SIR ALBERT HOWARD

Before a Lunch-time Meeting on Post-war Reconstruction of the Town and Country Planning Association on Oct 19th, 1944.

THE efficiency of our greatest possession — our population — depends on five things — air, water, *food*, warmth, and shelter. All planning schemes, therefore, must be based on this Big Five.

There are three important things about food: (1) it must be produced on fertile soil; (2) it must be fresh, and (3) its cost must be stabilized so as to put an end to the constant rise in prices.

All these things are possible once we increase the efficiency of the earth's green carpet — the machinery provided by Nature for producing food. The sun provides the energy for running this machine. We can increase threefold the efficiency of the green carpet by the restoration and maintenance of soil fertility by means of freshly prepared humus made mostly from materials now running to waste. This involves the reform of the manure heap by a tractor-driven machine. This has been done and the cost of making and spreading farmyard manure has been reduced from 12/6d. a ton to 1/8d. a ton, i. e. to one-seventh. In the future our cheapest and best food will be obtained by mechanized organic farming and gardening — a problem now exercising the pioneers, including Mr. Henry Ford and his associates.

OUR FOOD MUST BE GROWN ON FERTILE SOIL AND IT MUST BE FRESH.

How can we prove this? By feeding suitable collections of people by means of the canteen meals now so common. Examples are already available which indicate what can be done both in schools and in factories.

Schools. The results obtained at a number of schools, e. g. a preparatory school at Sidmouth and a public school — St. Columba's College near Dublin — prove what fresh food from fertile soil will do for the health of the boys. St. Columba's College has a farm of its own, where most of the work is done by voluntary boy labour. More examples of this kind are urgently needed in this country.

Canteen meals. An outstanding success in factory canteen meals has been reported from the Co-operative Wholesale Society's bacon factory at Winsford, Cheshire. Much of the food is grown on a model garden round the factory; the bread is whole wheat bread raised from fertile soil. Absenteeism due to ill health has fallen; the efficiency of the factory has gone up; the output of work has increased, and things have gone with a swing after the food of the workers came to them fresh from soil in good heart. Here is a simple method of dealing with industrial fatigue and of bringing capital and labour into a similar happy partnership as already exists between any good farmer and his team.

Whole wheat bread. While the land round some of our factories is being got into shape, we can make a beginning with bread. We must substitute for the murdered whitish bread bequeathed to us by Lord Woolton real bread made from home-grown wheat to which nothing has been added and from which nothing has been subtracted during milling. Samples of such bread have been provided for this lunch. The use of this bread will soon help to prevent such common ailments as colds, influenza, pneumonia, rheumatism, and above all constipation.

(Editor's Note) — The one draw-back in raising food too close to a factory is the deleterious effect of its sulphur-laden smoke. Sulphur is one of the most noxious elements used so extensively in agriculture. It kills off the biologic life of the soil.

Sawdust And Seaweed

Reprinted from Horticulture

ONE of the things war has taught people who work with plants is to find some use for materials formerly ignored as superfluous. For over two years I have been experimenting with sawdust and I find that if used carefully it has some value in certain soils. At one time sawdust was considered definitely detrimental to the soil and it is possible that the dust from some hard woods may be, but the only sawdust I have used is from Douglas fir, Pseudotsuga taxifolia.

It is a well known fact that sawdust and shavings are capable of temporarily tying up the nitrogen in the soil. To quote from *"The Effect of Sawdust on Plant Growth" published in* 1943 *by the Michigan Agricultural Experimental Station,* "Evidence is presented to show that nitrate formation is not prohibited by the sawdust but that the detriment is a result of the assimilation of nitrates after they are formed." These sawdust-absorbed nitrates are, I believe, eventually available to plants.

I went very carefully with sawdust at first, using a thin layer as a mulch. As far as fertilizing went this seemed the first year neither to do much good nor much harm though the sawdust was of benefit to the physical nature of the soil,—just as pine-needle mulch had proved to be. The earth of my windy hillside contains a large proportion of decomposed granite and though drainage is perfect, the soil becomes close and hard during the Summer's drought and is much better off with a mulch.

Then I hit on the plan of combining sawdust with seaweed, for this is a commodity which is close at hand and, although its chief contribution is potash, it is also rich in nitrogen. This worked better, although the good results were not evident until the early Winter rains arrived to cheer up the flower garden.

Applying a seaweed and sawdust mulch is a lazyman's method and there is a much better way of using these two neglected resources. Every compost I now make contains several thin layers of sawdust and just as many thicker layers of seaweed and this affair with the nitrogen takes place before the materials reach the plants. Most of my compost goes into the vegetable garden for vegetables are gross eaters and drinkers and need the pampering which my flowers, being species plants native to those parts of Africa, Australia, Mexico and the Americans having yearly periods of drought, get along very nicely without.

It was only after I took to well-planned composting that my vegetable garden became as much of a success as is possible on a windswept slope in the foggy, Summer-cold section of California. Beside the sawdust and seaweed, the compost contains layers of wood ashes, pine needles, garden refuse and a little manure. It is kept moist and turned every few weeks. When ripe it gives the weeks. When ripe it gives the vegetables all they need as far as soil requirements are concerned.

—Lester Rowntree.
Carmel, Calif.

Fun on Forty Acres

A Heap of Living

By MILDRED JENSEN LOOMIS

Condensed from Land and Home (Des Moines, Iowa)

JOHN and I were in the garden together. I had volunteered to use Queen in harrowing the harvested section while he furrowed out for a late planting. I plodded along with real pride in this so-called man's job, and a strong respect for Queen. At the end of each row she would swing broadly for the return trip with very little guiding. When she would step over the tug, and I bent down, with my ear at her heels, to set it right, I felt that kinship with a horse which, a few years ago, I would have thought was never for me.

After 16 years of professional life, I am married and have for four years shared and helped develop Lane's End Homestead. Working with cows and horses was one of the last feats for me to accomplish. The powerful hulk of a work horse always kept me at a respectful distance, and I shuddered at the proximity necessary to harnessing and hitching. But I remember the dilemma during our first spring which pushed me past that hurdle. Bringing straw with the wheelbarrow for mulching the potato patch was too slow. I was home alone, but I finally decided to get the stiff mare and use the wagon.

The harness on its peg was a hopeless tangle. The only guide I could think of was an illustration in the mailorder catalogue. So with the catalogue propped

up in the manger, I began to solve the puzzle. Getting up to Queen with this bundle of straps was almost more than I could manage, but her patience was a boost to my confidence. Somehow I got the hames over her shoulders and the tailpiece adjusted, and figured out what to buckle where. In an hour Queen was between the shafts and the wagon drawn from the shed.

But she didn't relish the pulling. Something was annoying her. Not that she had enough spirit to balk, but she definitely hated to go. In trying to lead her I saw that a strap fastened in front of her neck was cutting in after a fashion that was peculiar even to my inexperience. I checked with the catalogue and found I'd failed to put on her collar.

What I've learned since then would fill a big book—through experiences which have increased vigor of body, skill of hands, growth of mind, and depth of emotion; and have called forth unsuspected artistic and productive achievement. In fact, these four years have been an education in living for which I had vaguely longed for years, but which none of my five or six alma maters had provided or even suggested.

A kind of weariness had settled on me after that long period of school-teaching, religious education, and social work. I was wondering if life shouldn't hold more than I was getting when there came word of an educational institution with the fascinating name, School of Living. "Education," said its brochure, "arises out of, and must deal with, the actual affairs of life." I went to spend a summer and stayed on to work in it. I found it demonstrating the first of its significant tenets "that a good living pattern is the primary need and logical aim of every individual." The School of Living is a model, productive, family-sized living plant in its natural community, where faculty and students together do all that goes with directly producing all of one's own food, clothing, and shelter. At the same time, hours on end are spent analyzing and experiencing the deeper meaning of this integral living.

Here I was brought face to face, for the first time in my life, with the basic implications and challenge in the family and a home. For here the home flowers into its best, the *homestead,* where the family, maintaining its natural bond of unity, lives and works for the satisfaction and development of all its vital needs and capacities. Here *life* itself, not wages, money, nor fame, is the object of living. Having seen this light, nothing else seemed desirable, and, as proof of how life opens up when one is ready, there came the fortunate chance to shape the rest of my future in this pattern.

So now I live on a small farm, 30 acres of fields and eight of woods. In the days when country was merely a geographical area through which one passed in getting from one city to another, it would have seemed inconsequential. Now it means good black soil, full of living bacteria which we nourish with organic matter and protect from the offense of chemicals. Now it means awakening to the mystery of life and growth; it means watching green shoots glistening in the sun, and later when they head out and turn golden, quickening to the ritual of harvest. It means kinship with weather, anguish at the death of the mare, thrilling to blossoming fruit trees, responding to the slow movements of the earth itself.

We have 12 sheep, a team, several cows, some pigs and their young, a small flock of chickens and turkeys, a few hives of bees, and a lovely collie. This proves, for us, the requisites for full production, *first,* of practically all of our needs. Only a natural surplus is sold. Since we do not produce first for sale, land, equipment, and labor are at a minimum. We raise all our own food: vegetables, fruit, cereals, meat and lard, milk; eggs, cheese, flour, molasses, honey. We process everything, doing our own butchering (storing much of the meat in a freezing unit), making of soap, canning, churning, cheesemaking, grinding of flour and cereal, basketmaking, weaving of woolen cloth. Sale of wool, lambs, cream, occasional calf, and grain takes care of essential outlays for taxes, gasoline, electricity, education, and travel.

Our own sheep's wool is spun at a near-by mill (though spinning is on our schedule) and we dye and weave it at home into blankets, drapes, and garments. We ourselves did much of the refashioning of a 110-year-old cottage. Our living room with its pine-paneled walls and copper-hood fireplace has more than 30 items of furnishings from our own or friends' hands. The kitchen, on the other hand, is replete with modern labor-saving *tools,* and drudgery is eliminated with electricity. (A tool is anything which helps you do *your* work. A machine is a thing which *you* help.) Churning, kneading of bread, preparing of juices, and grinding meat are done by various attachments on a heavy-duty kitchen mixer. Flour is ground as we need it in a $15 kitchen mill. Cooking, washing, ironing, pumping are done electrically for about $5 a month.

We like to point out that almost everything we have is produced at home or is a tool to

assist in that production. Our tools remove most, if not all, of our lives from the exploitation of the machine. It is just ten minutes from the wheat kernel to the oven, at our house, for a tasty and nutritious batch of muffins containing, in addition to the home-ground flour, our own lard, eggs, buttermilk, and honey. We see no need for a nine-story flour mill. Each week we bake three two-pound loaves of whole-wheat bread for a total of 15c, including every item of cost for material, equipment, overhead, depreciation. At the store its equal in nutrition could not be had for 66c. Such *work* requires ten minutes assembling materials and washing equipment. In that ten minutes I have saved 51c, or earned at the rate of about $3 an hour. On cereals we save even more. Fluffy, devitalized packaged cereals are bought at the rate of from 30c to 60c a pound. I make two kinds of cooked porridge, delicious "grape-nuts" and pressure-cooked whole kernels, from our own fields at not more than 2½c a pound. Our grocery bill is usually but a few dollars a month and rarely reaches $5. We seldom use ration tickets. It would cost $50 or $60 to purchase at a store an amount equal to our monthly consumption.

Because of this type of living and because of a diet of whole foods direct from our garden and dairy, our health is much improved. We are noticeably free from colds.

Sometimes when the radio reminds us of the chaos, suffering and tragedy in the world there comes a flash of guilt that our life should be such fun. But we know that all we have is from our own efforts.

Basic to the new quality of our living is the joining of consumption and production. *Work* is satisfying because it means *creating*: planning, purposing, designing, executing, and taking the consequences. Preparing soil, planting, growing, tending, garnering, and processing make of our food actually "sun, soil and human toil." We feel the independence and integrity of our achievement. No boss nor supervisor can upset the security of our well-stocked larder. We sing, do folk dances, and converse with our neighbors; visitors are numerous; we subscribe to (and read) 20 magazines; we have time for study and meditation.

Polar Vegetable Gardens

By IVAN YEROFEYEV

Reprinted from Information Bulletin Embassy of the Union of Soviet Socialist Republics.

I recently made an air-tour of some of our Soviet Polar settlements. The people of these regions are noted for their hospitality, but I admit I was astonished when in a little township on the Yan River not far from Verkhoyansk, in the frigid zone, I was served with fresh lettuce, radishes, new potatoes and cauliflower.

The average temperature in this area is 16 degrees below zero Centigrade. In winter the sun disappears completely for six weeks and the mercury drops to 70 below Centigrade. In summer the sun shines day and night for six weeks. Altogether, there are only 70 warm days a year.

Last year, for the first time, the Yan River farmers tried growing vegetables in the open. The experimental area was only 12½ acres. It gave an excellent yield of cabbage, turnips, spinach, lettuce, radishes and potatoes. This year the planted area was increased to 30 acres. The spot chosen is well protected from the cold north winds. Organic and mineral fertilizers were used to prepare the ground; the manure, besides serving as a fertilizer, isolated the plants from the cold rising from the frozen ground.

Only quick-ripening varieties were planted; cabbage, for instance, ripens in 100 to 110 days, but for 45 days of this period the plants are kept in hothouses. The sprout method is used with potatoes, which gives them a good start in hothouses.

Similar methods have been tried out on farms at Tixie Bay, Cape Dixon and other points on the Arctic Coast, where cucumbers, tomatoes and other vegetables are successfully grown. Hothouse vegetables, milk and milk products, and fresh meat received from local dairies and big farms in the Far North satisfy the requirements of nurseries, kindergartens and hospitals.

The Union of Workers of the Northern Sea Route supplies all gardens in the Polar regions with seed, textbooks and pamphlets on vegetable growing, and broadcasts regular information on gardening in the Far North.

Editor's Note.—In 1928 the U. S. consumed 1,488,000 tons of chemical nitrogen, phosphorous and potash. In that year, the equivalent figure for Russia was only 30,000 tons.

Reader's Correspondence

PLEASE WRITE ON ONE SIDE ONLY.
Send stamped, self-addressed envelope for reply.

SANI-SOIL

Dear Mr. Rodale:

I have noticed, in all the copies of Organic Gardening that I have received, an advertisement of "Sani-Soil" made from redwood bark. There are other advertisements of earthworms. It seems to me that there is a close relationship between earthworms and organic gardening since earthworms increase in direct proportion to the amount of decaying organic matter in the soil.

Some time ago I read a book called "Friend Earthworm" by Dr. George Sheffield Oliver. I haven't the book now, but in the notes I took from the book I have a record of his advising against using *redwood tree sawdust or shavings for earthworm compost.* I haven't any notes of the reason, but I believe that it was found to be injurious even to the extent of being poisonous to the earthworms.

As far as I know Dr. Oliver is one of the best authorities on earthworms. For this reason, *I'm sure that you will agree that it would be a good idea to make a test of the possible harmfulness* of redwood bark before advertising it along with earthworms.

I sincerely hope that you will receive this suggestion not as a criticism of your magazine but as a possible help from someone who is greatly interested in the successful development of organic gardening.

William H. Soule,
Wiscasset, Maine.

Answer

Dear Mr. Soule:

In reply to your letter of October 25th, you are right about the actual wood of the Redwood tree being bad for earthworms, but for some strange reason, the bark of the Redwood tree, from which Sani-Soil is made, does not have that characteristic. We raised that question a few months ago and had Dr. Barrett of the California Earthworm Farms, make tests. The results were written up in the September issue of ORGANIC GARDENING. I trust this answers your question. You will find that we will exercise great care in accepting advertisements for our magazine. In fact we have turned down many advertisements because we felt they were not in the interest of the organic gardener. Our responsibility to our readers comes first.

—o—

SOOT

Is furnace soot, from an oil furnace considered plant food or good for the compost heap?

Answer

We certainly would not recommend any kind of furnace soot as a fertilizer, as it contains sulphur, one of the worst elements that could possibly be used in the soil.

—o—

OYSTER SHELL FLOUR

Is oyster shell flour as good as ground limestone for the compost pile?

M. B. Ross,
Los Gatos, Calif.

"SOILUTION EARTHWORMS"
THE AUTOMATIC GARDENER
OHIO EARTHWORM FARMS
THE WARNER'S
WORTHINGTON, OHIO.

DOMESTICATED EARTHWORMS. A complete production manual. "EARTHWORMS: Their Intensive Propagation and Use in Biological Soil Building," prepaid for $1.00, with 30-day return privilege. A valuable bulletin on earthworm culture free on request.
THOS. J. BARRETT,
Earthmaster Farms, Box C-10,
Roscoe, Calif.

Subscribe To
ORGANIC GARDENING
Organic Gardening
Emmaus, Pa.
Gentlemen:
Enclosed is $2.00 for one year subscription (12 issues) to Organic Gardening.
NAME .....
.....
ADDRESS .....
.....

The
GRAVELY
GARDEN TRACTOR & POWER MOWER
Three machines in one.
Ideal for the Estate Owner.
Cultivates your garden . . cuts tallest weeds . . mows your lawn
GRAVELY MFG. CO. Box 150 Dunbar, W. Va.
WRITE FOR CATALOG

"TOOTH DECAY CAN BE HALTED"

SCIENCE DISCOVERS NEW WAY TO STEM APPALING WIDESPREAD CALCIUM DEFICIENCY THROUGH ORGANIC BONE FLOUR

And to Supply Missing Calcium. Phosphrous and Flourine for Sufferers from Decaying Teeth and Unbalanced Nerves. Texan town where nearly all inhabitants have perfect teeth due to high Flourine content of soil.

Free Literature upon request. Write to **Biochemic Food Products, 1926 W. Railroad St., Loupurex, Penna., P. O.**

- Cuts Down Watering
- Saves Cultivation
- Reduces Weeding
- Improves Root Development

Ask your dealer, or
Redwood Fibre Prod. Co.,
Dept. O.,
Santa Cruz, Calif.

Answer

Dear Mr. Ross:

Oyster shell flour is just about as good as ground limestone. Both ground limestone and oyster shells consist of about 90 to 95% calcium carbonate. The balance represents various other elements, which vary. For example, lime may be richer in magnesium than oyster shells. On the other hand, the latter, coming from the ocean, would be richer in iodine and other seagoing elements. It would not be a bad idea to alternate using at one time lime and at another time oyster shell flour, if obtainable. In the goitre belt regions, such as Ohio and Michigan, where the soil lacks iodine, oyster shell flour would be especially recommended. The Indians used to accumulate a lot of oyster shells around their camps and knew its value as a fertilizer.

—o—

TOMATO VINES

Would tomatoe vines do my victory garden any good or should I remove them now?

M. Dalema Drafer,
Milford, Del.

Answer

Dear Mrs. Draper:

Tomato vines should be saved and allowed to rot separately and used as a fertilizer for your next year's tomatoes. This is one of the very few plants that thrive on residues from its own growth.

—o—

GREEN MATTER

Dear Sir:

Being another so-called new jay in connection with Organic Gardening, I am seeking a little information and advice.

For the past two years, have worked a vegetable garden, size 35x70, and want to improve the soil in the best and most economical way possible. I have access to all of the sprouts taken from a seed-testing laboratory, same being all kinds of vegetable seeds. The larger portion of them consist of beans and peas, and are very tender, from 2 to 8 inches long, and get about 45 pounds per week. For the past month, have been digging them into the soil from 4 to 5 inches deep, and if possible would like to know if this will have a good or bad effect on the soil.

Another item to be had, is bean screenings, i. e. broken beans which are sold very cheaply as hog food. Contemplate using some of them by turning under this fall. Is this good or bad? Used about 50 pounds in making my 5x5 compost pile this past week. Soaked them in water overnight before using.

Geo. W. Lay,
St. Louis, 9, Mo.

Answer

Dear Mr. Lay:

Thank you very much for your order. Regarding the sprouts that you mentioned, a limited amount only could be dug into the soil to decay, but if you have too many, it will interfere with the growth of your next crop. Therefore, it is best to compost them. The same applies for bean screenings. The idea of soaking this type of material over night is helpful.

—o—

WEEDS

Gentlemen:

I own a farm of 90 acres in

Jefferson Co. Ohio, near Martins Ferry, *it is nearly all hillside land* —much of which is covered with a rank growth of what is known *as broom sage*—it grows in clump-like form and just "takes" the top soil—*what is the best method of getting rid of it?* I consulted the Ohio State University and they recommend 2200 lbs. of lime to the acre, but I would like your advice on the problem.

Mrs. Scott Krauss,
Columbus, Ohio.

Answer

Dear Mrs. Krauss:

Broom sage is a weed which indicates that all is not well with the land. When a soil is almost ready to be abandoned, broom sage will take over. It will not grow in quantity enough to do harm on a fertile soil. Your solution then is to get your farm into good organic heart by using plenty of compost.

—o—

LAWNS

I am interested in building a good lawn, but have quite a lot of shade. Any information would be appreciated.

Peter Fahr,
Bay Village, Ohio.

Answer

Dear Mr. Fahr:

In order to build a good lawn where there is a lot of shade, it would be advisable to spade up your own lawn thoroughly and mix it with plenty of compost or purchased peat humus. I would also sprinkle it lightly with bonemeal and dried blood if you could purchase it. Then I would purchase, through the regular seed channels, grass that is adaptable for planting in shaded areas.

There is another more heroic method to be followed where you have a lot of shade. This was used by the Baltimore Park System many years ago and by this method they obtained a wonderful stand of grass underneath certain kind of trees in which the branches were very low and threw an unusual shade.

They placed horse manure under each tree to a depth of a foot. They did not do any grass seeding, but since horse manure is full of weeds and various grass seeds, they merely permitted these to come up. Naturally, nothing came up unless it could grow in conditions of shade because a type of grass or weed that needed the sun would not grow under those conditions. They did not cut the grass the first year, but allowed what sparse grass

De La Mare Garden Books

CITY AND SUBURBAN GARDENING
By Chesla C. Sherlock
196 pages. 77 illus. $1.00
A book for those who wish to make the most of moderate space. Years of experience in city and suburban gardening and contacts with thousands of home owners enable the author to write with authority.

BOOK OF PERENNIALS. By Alfred C. Hottes
280 pages. 103 illus. $2.00
Among amateur gardeners there is a decided preference for perennial plants, largely because they require but little care and so generously reward even that little. For those desiring a continuous show of color from early Spring to early frost in their gardens, this book will be extremely valuable, discussing over 125 separate species individually. culture and requirements.

PRACTICAL LAWN CARE. By Mortimer C. Merritt
32 pages. Illus. 75c.
Gives all the essential information for making a new lawn or the renovation of an old one, plus ways and means for keeping lawns in good condition.

1001 GARDEN QUESTIONS ANSWERED
By Alfred C. Hottes
388 pages. 160 illus. $2.50
An amazing collection of useful information for the amateur gardener wishing to plan and manage his own home grounds.

THE BOOK OF TREES. By Alfred C. Hottes
448 pages. 200 illus. $3.50
An all-around handbook for the tree lover and tree planter. There are chapters on trees important in American history on favorite tree poems, on street trees, on roadside trees, on nut trees, etc. Transplanting, pruning and propagation are covered and a variety of helpful lists for various purposes are given.

BIRDS OF THE WILD. By Frank C. Pellett
128 pages. 74 illus. $1.00
Of absorbing interest to the bird lover who wishes to attract the feathered friends to his home garden.

BOOK OF ANNUALS. By Alfred C. Hottes
180 pages. 158 illus. $1.50
The author opens up many new possibilities to garden makers in this book, which is exceedingly complete, and all in all is a most useful manual dealing with annual flowers.

HOW TO LANDSCAPE YOUR GROUNDS
By Loyal R. Johnson First Edition
232 pages. 147 illus. $2.75
For the benefit of the hundreds of thousands of home builders and owners in the medium income bracket who are anxious to beautify their home surroundings to the best advantage at small expense. Not to be found in any other landscape book are its planting plans covering practically every section of the country—from Massachusetts to Florida and Louisiana, and from the Middle West to California—

Organic Gardening — Emmaus, Pennsylvania

AN AGRICULTURAL TESTAMENT

SIR ALBERT HOWARD C. I. E., M. A.

By Sir Albert Howard, C.I.E., M.A.

Formerly Director Institute of Plant Industry Indore, and Agricultural Adviser to Central India and Rajputana.

This is a remarkable book published by the conservative Oxford University Press. It gives the complete history of Sir Albert Howard's development of his process of making compost. It describes the events in The West Indies and India that led up to his epoch-making discovery. After reading this amazing book, if it does not thoroughly convince you that the organic way is the best your money will be cheerfully refunded. Many gardeners date their conversion to the organic method from the time of reading this Testament.

CONTENTS

1 Introduction

Part I

The Part Played By Soil Fertility In Agriculture

2 The Nature of Soil Fertility
3 The Restoration of Fertility

Part II

The Indore Process

4 The Indore Process
5 Practical Application of the Indore Process
6 Developments of the Indore Process (A)
7 Developments of the Indore Process (B)
8 Developments of the Indore Process (C)

Part III

Health, Indisposition, and Disease in Agriculture

9 Soil Aeration
10 Some Diseases of the Soil
11 The Retreat of the Crop and the Animal Before the Parasite.
12 Soil Fertility and National Health

Part IV

Agricultural Research

13 A Criticism of Present-day Agricultural Research
14 A Successful Example of Agricultural Research

Part V

Conclusions and Suggestions

15 A Final Survey
Appendixes

This is the recognized standard text book for gardeners and farmers who wish to change from the use of ordinary chemical fertilizers to home-made organic fertilizers. Sir Albert Howard has forty years of active experience in the field of organic fertilizers and is the accepted leading authority on the subject.

We have arranged to print this book in the United States and have been able to reduce the price to ....

$3.50

Postpaid

Canada and Foreign—35c extra.

Organic Gardening

Emmaus, Pa.